

wherein said second hollow elongated member is continuously opened to said bypass flow.

18. (amended) The method of claim 12, [wherein said] further comprising a separation device [is] selected from the group consisting of caps, centrifugal separators and cyclones.

REMARKS

35 U.S.C. § 112, First Paragraph Rejections

Applicants note with appreciation Examiner's withdrawal of the previous 35 U.S.C. § 112, first paragraph rejections.

35 U.S.C. § 112, Second Paragraph Rejections

Applicants' claim amendments have addressed and/or rendered Examiner's indefiniteness rejections mute. Reconsideration and withdrawal of all § 112, second paragraph, rejections is respectfully requested.

Previous 35 U.S.C. § 102 and 103 Rejections Based on Beal Alone

Applicants acknowledge with appreciation Examiner's withdrawal of previous 35 U.S.C. §§ 102 and 103 rejections based on Beal alone (U.S. Patent 3,607,000).

New 35 U.S.C. § 103 Rejection

Examiner has made a new § 103 rejection based on the combination of Beal and U.S. Patent 4,313,908 to Gupta et al (hereinafter "Gupta"). The rejection is respectfully traversed.

A prima facie case of obviousness requires that some teaching or suggestion be found in the cited reference (or references) on how to modify the reference (or references) to obtain all of the elements of the claimed invention. See M.P.E.P. §§2143.01 and 2143.03 Seventh

Edition, Rev. 1, February 2000. The proposed combination of the cited references does not teach all of the elements of the present invention as claimed.

For example, Applicants respectfully point out that neither Beal nor Gupta teach the cage element of the bypass device used in the present invention. The Examiner suggests that the wire mesh basket (84) shown in Figure 7 of Beal is a cage member as disclosed and claimed in the present invention. Applicants respectfully disagree. Beal discloses a bypass device that is a "substantially vertical and straight normally closed standpipe or conduit means". Beal, column 1, lines 23-25. The standpipe is shown in Figures 7 and 8 as items 72 and 110 respectively in Beal. Referring to Figure 7 of Beal, the standpipe 72 has discharging slots 80 at its lower port. The discharge slots 80 are surrounded by a bed 82 of 1/4 inch alumina balls contained within the wire mesh basket 84. Id. at column 14, lines 69-70.

[The cage member of the present invention bypass device is substantially different from Beal's wire mesh element. Moreover, the wire mesh of Beal is filled with large packing material such as alumina balls. In contrast, the present inventive method uses a cage member that is free of any packing material.]

Other differences exist. [For example, the Beal reference requires the presence of a closure means, such as a rupture disc (74) or a butterfly valve inside their bypass apparatus.] Beal, column 14, lines 56-58. Applicants' claims exclude such a closure means or rupture disk. [Applicants' claims require the use of a bypass apparatus having a bypass tube that is continuously open to the bypass flow.] The Examiner cites Gupta as teaching this element of the present invention. Applicants respectfully disagree.

Gupta relates primarily to a two phase, gas-liquid flow reactor. Gupta teaches the use of bypass tubes having different heights to achieve bypassing of both the liquid and the gas flow. Specifically, Gupta teaches that as the catalyst bed loses permeability due to fouling, the liquid, unable to pass through the bed, builds up above the bed. The shorter tubes become available for liquid bypass while the longer tubes are available for gas bypass. [Thus, Gupta teaches that the pressure drop is minimized by using separate bypass tubes for the liquid and gas.]

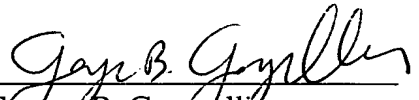
The present invention method is applicable to one phase flow as well as a two phase gas-liquid phase flow without the need of different height bypass tubes. We have found that the use of the inventive bypass device lowers the pressure drop sufficiently, even in a two phase flow, to allow the liquid to pass through the partially fouled top layer of the catalyst. Thus, in a liquid-gas flow application bypassing gas only using the inventive bypass device substantially extends the operating life of a fixed bed reactor.

For at least the foregoing reasons, it is respectfully submitted that all pending claims as amended are not obvious in view of the cited references.

CONCLUSION

Applicants respectfully submit that this Amendment places the application in condition for allowance. If the Examiner believes that prosecution and allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to the favorable disposition of the application.

Respectfully submitted,


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☒ Pursuant to 37 CFR 1.34(a)

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